

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Buchwalter et al.

Examiner:

Serial No.:

Art Unit:

Filed:

For: CAP ATTACH SURFACE MODIFICATION FOR IMPROVED ADHESION

Commissioner for Patents
Washington D.C. 20231

Preliminary Amendment

Sir:

Kindly enter this amendment prior to initial examination.

In the Specification:

Page 1, between lines 1 and 2, insert: --This application is a divisional of Serial No.

09/361,723, filed on July 27, 1999.--

In the Claims:

Please cancel claims 1-9. The following claims 10-29 are currently pending.

10. A method for forming an electronic structure, comprising:

providing a metallic plate;

forming a mineral layer on the metallic plate; and

forming an adhesion promoter layer on the mineral layer.

11. (AMENDED) The method of claim 10, wherein forming a mineral layer includes forming the mineral layer having a mineral selected from the group consisting of silicon dioxide, silicon nitride, and silicon carbide.

12. (AMENDED) The method of claim 10, wherein forming a mineral layer includes forming the mineral layer having a thickness between about 50 angstroms and about 2000 angstroms.

13. (AMENDED) The method of claim 10, wherein forming a mineral layer includes sputtering the mineral layer on the clean surface of the metallic plate.

14. (AMENDED) The method of claim 10, wherein providing a metallic plate includes providing the metallic plate having a metallic substance selected from the group consisting of stainless steel, aluminum, titanium, copper, copper coated with nickel, and copper coated with chrome.

15. (AMENDED) The method of claim 10, wherein forming an adhesion promoter layer includes forming the adhesion promoter layer having an adhesion promoter selected from the group consisting of a titanate, a zirconate, and an aluminate.

16. (AMENDED) The method of claim 10, wherein forming an adhesion promoter layer includes forming the adhesion promoter layer having a silane from the group consisting of 3-glycidoxypropyltrimethoxysilane, 3-glycidoxypropyltriethoxysilane, 3-(2-aminoethyl)propyltrimethoxysilane, and 3-(2-aminoethyl)propyltrimethoxysilane.

17. The method of claim 10, further comprising:

providing an electronic assembly;

providing an adhesive material;

coupling the metallic plate to the electronic assembly by interfacing the adhesive material between the adhesion promoter layer and the electronic assembly;

providing an electronic carrier;

coupling the electronic assembly to the electronic carrier; and

coupling the metallic plate to the electronic carrier by interfacing the adhesive material between the adhesion promoter layer and the electronic carrier.

18. (AMENDED) The method of claim 17, wherein providing an adhesive material includes providing the adhesive material having a structural epoxy adhesive.

19. (AMENDED) The method of claim 17, wherein providing a metallic plate includes providing the metallic plate having a coefficient of thermal expansion (CTE) that exceeds a CTE of the electronic assembly.

20. (NEW) The structure of claim 10, further comprising bonding the adhesion promoter layer to a structural adhesive.

21. (NEW) The structure of claim 10, wherein the adhesion promoter layer has a thickness between 1 monolayer and about 50 monolayers.

22. (NEW) The method of claim 10, wherein forming an adhesion promoter layer includes forming the adhesion promoter layer comprising a chemical compound in crystalline form.
23. (NEW) The method of claim 10, wherein forming an adhesion promoter layer includes forming the adhesion promoter layer comprising a chemical compound in amorphous form.
24. (NEW) The method of claim 10, wherein forming a mineral layer comprises forming the mineral layer covering an edge surface of the metallic plate and a portion of a top surface of the metallic plate.
25. (NEW) The method of claim 10, wherein forming a mineral layer includes forming the mineral layer having a thickness between about 100 angstroms and about 1000 angstroms.
26. (NEW) The method of claim 10, wherein forming a mineral layer includes forming the mineral layer having an approximately uniform thickness.
27. (NEW) The method of claim 10, wherein forming an adhesion promoter layer includes forming the adhesion promoter layer having an adhesion promoter comprising a silane.
28. (NEW) An electronic structure, comprising:
 - bonding a mineral layer to a metallic plate; and
 - covalently bonding an adhesion promoter layer to the mineral layer.

29. (NEW) An electronic structure, comprising:

bonding a mineral layer to a metallic plate; and

bonding an adhesion promoter layer to the mineral layer such that said bonding to the mineral layer is moisture resistant.

Remarks

Prompt and favorable examination on the merits is respectfully requested. Applicant's respectfully submit that the entire application is in condition for allowance. However, should the Examiner believe anything further is necessary in order to place the application in better condition for allowance, or if the Examiner believes that a telephone interview would be advantageous to resolve the issues presented, the Examiner is invited to contact the Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,

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Date: 01/04/2002

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Appendix A. Identification of Amended Material

Claims 11-16 and 18-19 are amended herein as follows.

11. (AMENDED) The method of claim 10, wherein [the step of] forming a mineral layer includes forming the mineral layer having [selecting] a mineral selected from the group consisting of silicon dioxide, silicon nitride, and silicon carbide.
12. (AMENDED) The method of claim 10, wherein [the step of] forming a mineral layer includes forming [a] the mineral layer having a thickness between about 50 angstroms and about 2000 angstroms.
13. (AMENDED) The method of claim 10, wherein [the step of] forming a mineral layer includes sputtering [a] the mineral layer on the clean surface of the metallic plate.
14. (AMENDED) The method of claim 10, wherein [the] providing [step] a metallic plate includes providing the metallic plate having [selecting] a metallic substance selected from the group consisting of stainless steel, aluminum, titanium, copper, copper coated with nickel, and copper coated with chrome.
15. (AMENDED) The method of claim 10, wherein [the step of] forming an adhesion promoter layer includes forming the adhesion promoter layer having [selecting] an adhesion promoter selected from the group consisting of [a silane,] a titanate, a zirconate, and an aluminate.

16. (AMENDED) The method of claim 10, wherein [the step of] forming an adhesion promoter layer includes forming the adhesion promoter layer [selecting] having a silane from the group consisting of 3-glycidoxypropyltrimethoxysilane, 3-glycidoxypropyltriethoxysilane, 3-(2-aminoethyl)propyltrimethoxysilane, and 3-(2-aminoethyl)propyltrimethoxysilane.

18. (AMENDED) The method of claim 17, wherein [the step of] providing an adhesive material includes providing the adhesive material having a structural epoxy adhesive.

19. (AMENDED) The method of claim 17, wherein [the step of] providing a metallic plate includes providing [a] the metallic plate having a coefficient of thermal expansion (CTE) that exceeds a CTE of the electronic assembly.